

CLAIMS

1. A process for the catalytic hydrodealkylation alone of hydrocarbon compositions comprising C₈-C₁₃ alkylaromatic compounds, optionally in a mixture with C₄-C₉ aliphatic and
5 cycloaliphatic products, including the processing in continuous of said hydrocarbon compositions, in the presence of water, with a catalyst consisting of a ZSM-5 zeolite having a molar ratio Si/Al ranging from 5 to 35, modified with at least one metal selected from those belonging to
10 groups IIB, VIB and VIII, at a temperature ranging from 400 to 700°C, a pressure of between 2 and 4 MPa, and a molar ratio between H₂O/charge ranging from 3 to 6.
2. The process according to claim 1, wherein the catalytic hydrodealkylation reaction is carried out in the
15 presence of water, previously vaporized and mixed with the hydrocarbon fraction in gas phase before the reactor inlet, or added to the liquid hydrocarbon fraction until its saturation at room temperature, or by means of a compound miscible with the charge and capable of releasing it during
20 the reaction.
3. The process according to claim 1 or 2, wherein the compounds capable of releasing water and generating aliphatic and/or aromatic hydrocarbon species of the same nature as those present in the liquid and gaseous phase of
25 the reaction, are alcohols, ethers, esters, or their mix-

tures.

4. The process according to claim 3, wherein the compounds are ethanol or phenethyl alcohol.

5. The process according to any of the previous claims, wherein the molar ratio between water and charge in the feeding to the reactor, ranges from 0.0006 to 0.16 (i.e. from 0.01 to 2.5% w/w), preferably from 0.003 to 0.032 (i.e. from 0.05 to 0.5% w/w).

6. The process according to any of the previous claims, wherein the hydrodealkylation reaction takes place at temperatures ranging from 450 to 600°C, pressures ranging from 2.8 to 3.6 MPa, H₂/charge molar ratios ranging from 3.8 to 5.2, and with such reagent flow-rates as to guarantee an LHSV (Liquid Hourly Space Velocity), calculated on the hydrocarbon stream, ranging from 3 to 5 h⁻¹, preferably from 3.5 to 4.5 h⁻¹.

7. The process according to any of the previous claims, wherein the hydrocarbon charge subjected to hydrodealkylation comprises C₈-C₁₃ alkylaromatic compounds selected from ethylbenzene, xylenes, propylbenzenes, ethyltoluenes, trimethylbenzenes, diethylbenzenes, ethylxylenes, tetramethylbenzenes, propyltoluenes, ethyltrimethylbenzenes, triethylbenzenes, dipropyltoluenes.

8. The process according to claim 7, wherein the C₈-C₁₃ alkylaromatic hydrocarbon charge derives from reforming

units or from units which effect pyrolytic processes, or from steam-cracking.

9. The process according to any of the previous claims, wherein the hydrocarbon charge subjected to
5 hydrodealkylation comprises C₈-C₁₃ alkylaromatic compounds optionally mixed with C₄-C₉ aliphatic and cycloaliphatic products and organic compounds containing hetero-atoms.

10. The process according to any of the previous claims, wherein the catalyst consists of a ZSM-5 zeolite in bound
10 form, with binders selected from aluminas, among which pseudo-bohemite and γ -alumina; clays, among which kaolin-ite, smectites, montmorillonites; silica; alumino-silicates; titanium and zirconium oxides; mixtures thereof, with zeolite/binder weight ratios ranging from 100/1 to
15 1/10.

11. The process according to any of the previous claims, wherein the ZSM-5/binder catalyst is modified with at least one metal selected from those belonging to groups IIB, VIB and VIII.

20 12. The process according to claim 11, wherein the metal is molybdenum.

13. The process according to any of the previous claims, wherein the ZSM-5 zeolite is characterized by an Si/Al molar ratio ranging from 15 to 30.

25 14. The process according to any of the previous claims,

wherein the dispersion of metals on the catalyst is effected according to techniques selected from impregnation, ion exchange, vapor deposition or surface adsorption.

15. The process according to any of the previous claims,
5 wherein the ZSM-5 zeolite as such or in bound form is impregnated with metals of groups IIB, VIB and VIII according to methods which comprise:

- preparing one or more solutions of compounds of the metals to be carried;
- 10 - impregnating the zeolite with the above solutions;
- drying the zeolite thus impregnated:
- calcining the zeolite, impregnated and dried, at temperatures of between 400 and 650°C;
- possibly repeating the above steps several times.

15 16. The process according to claim 15, wherein the dispersion of the metals on the catalyst takes place by impregnation with an aqueous or aqueous-organic solution, the organic solvent being selected from alcohols, ketones and nitriles or their mixtures, containing at least one hydro- or
20 organo-soluble compound of the metal in such concentrations that the total final content of the metal in the catalyst ranges from 0.1 to 10% by weight.

17. The process according to any of the previous claims, wherein the total metal content in the catalyst ranges from
25 0.5 to 8% by weight.